

REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed May 10, 2005. Through this response, claims 18 and 19 have been amended, claims 37-59 have been added, and claims 1-9 have been canceled without prejudice, waiver, or disclaimer. Reconsideration and allowance of the application and pending claims 18-28 and 36-59 are respectfully requested.

I. Allowable Subject Matter

Applicants appreciate the Examiner's indication that claim 19 would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

In that it is believed that every rejection has been overcome, it is respectfully submitted that each of the claims that remains in the case is presently in condition for allowance.

II. Drawings Objection

The drawings have been objected to under 37 C.F.R. 1.83(a) for not showing every feature of the invention specified in the claims. Specifically, the drawings are objected to for not showing "the limitation 'a plurality of capacitive gaps and release a plurality of resonating elements...' in claim 36 must be shown or the feature(s) canceled from the claim(s)."

Applicants respectfully submit that drawings are not needed and not required for the understanding of the subject matter of claim 36. Applicants respectfully note that 35 U.S.C. 113 states that "[T]he applicant shall furnish a drawing where necessary for the understanding of the subject matter to be patented." (emphasis added) Likewise, 37. C.F.R. 1.81(a) states that "[T]he applicant for a patent is required to furnish a drawing of his or her invention where necessary for the understanding of the subject matter sought to be patented..." (emphasis added) Applicants

note that claim 36 recites “wherein the removing is performed to form a plurality of capacitive gaps and release a plurality of resonating elements, each of the plurality of resonating elements electrically isolated from each other.” Applicants have shown and described the removing and release features for a single gap and resonating element in and in association with FIGS. 5A-5F. Further, the specification supports the features of claim 36. For instance, in paragraph [0031] of Applicants’ specification, the following is described: “The use of a SOI substrate provides electrical isolation between the body of individual SCS resonators in an array implementation (*e.g.*, for filter synthesis). These methods are referred to herein as SOI-based CRF methods.” Applicants have also shown and described the removing and release features for a single gap and resonating element in and in association with FIGS. 5A-5F. Applicants respectfully submit that one skilled in the art, using the description and figures of Applicants’ disclosure, would understand how to implement the methodology described in claim 36. Thus, Applicants respectfully request that the objection to the drawings be withdrawn.

III. Claim Rejections - 35 U.S.C. § 112, First Paragraph

Claim 36 has been rejected under 35 U.S.C. § 112, first paragraph. The Office Action asserts that the “claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly added claim 36 is not supported by the disclosure.”

Applicants respectfully disagree, and wish to direct attention to paragraph [0031] of Applicants’ specification, which provides as follows: “The use of a SOI substrate provides electrical isolation between the body of individual SCS resonators in an array implementation (*e.g.*, for filter synthesis). These methods are referred to herein as SOI-based CRF methods.”

Thus, the features of dependent claim 36 are described in the Applicants' specification. Further, Applicants have also shown and described the removing and release features for a single gap and resonating element in and in association with FIGS. 5A-5F. Applicants respectfully submit the description and figures of Applicants' disclosure reasonably conveys to one skilled in the art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In that those objections are believed to have been overcome, Applicants respectfully request that the rejection of these claims under 35 U.S.C. § 112, first paragraph, be withdrawn.

IV. Claim Rejections - 35 U.S.C. § 102(a)/103(a) of claims 1-9

Claims 1 and 3-9 have been rejected under 35 U.S.C. § 102(a) as allegedly anticipated by *No et al* ("No," The HARPSS Process for Fabrication of Nano-Precision Silicon Electromechanical Resonators, IEEE Conf. Of Nanotechnology, pp 489-494, October 30, 2001). Claim 2 has been rejected under 35 U.S.C. § 103 (a) as allegedly unpatentable over *No* in view of *Ayazi et al*. ("Ayazi," High Aspect-Ratio Combined Poly and Single-Crystal Silicon (HARPSS) MEMS Technology, J. of Micro. Sys., Vol. 9, No. 3, September 2000). Applicants respectfully disagree, but in the interest of expediting allowance of the case, have canceled claims 1-9. Thus, Applicants respectfully submit that the rejection is rendered moot.

V. Claim Rejections - 35 U.S.C. § 103(a)

A. Statement of the Rejection

Claims 18 and 20-28 have been rejected under 35 U.S.C. § 103 (a) as allegedly unpatentable over *No* in view of *Lin et al*. ("Lin," U.S. Pat. No. 6,413,793). Applicants respectfully traverse this rejection.

B. Discussion of the Rejection

As has been acknowledged by the Court of Appeals for the Federal Circuit, the U.S. Patent and Trademark Office (“USPTO”) has the burden under section 103 to establish a *prima facie* case of obviousness by showing some objective teaching in the prior art or generally available knowledge of one of ordinary skill in the art that would lead that individual to the claimed invention. *See In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). The Manual of Patent Examining Procedure (MPEP) section 2143 discusses the requirements of a *prima facie* case for obviousness. That section provides as follows:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teaching. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must be found in the prior art, and not based on applicant’s disclosure.

Applicants respectfully submit that a *prima facie* case of obviousness has not been established. In particular, Applicants respectfully assert that the proposed combination is improper. It has been well established that teachings of references can be combined only if there is some suggestion or incentive to do so. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, there must be a teaching in the relevant art which would suggest to a person having ordinary skill in that art the desirability of combining the teachings of *Lin* and *No*. The Office Action asserts on page 6 the following:

No et al. does not explicitly teach the semiconductor-on-insulator (SOI) substrate. However, Lin et al. teach forming resonator structure on SOI substrate by removing oxide of the SOI substrate to prevent stiction by preventing the microstructure from falling down onto the substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form MEMS resonator of No on SOI

structure as taught by Lin since SOI structures prevents microstructure from falling down onto the substrate hence improving the micromachining process.

Applicants respectfully disagree that such a proposed combination is obvious. Applicants have included a declaration under 37 CFR. 1.132 to support their assertion that the proposed combination is improper. As described in the declaration, incorporated herein by reference, there is nothing in *No* to teach or suggest SOI-technology. In fact, *No* clearly emphasizes the benefits of an all-silicon structure. On page 493, *No* states that such a structure “translates to potentially better temperature and long-term mechanical stability of the fabricated resonators.”

Additionally, processing described in *No* would simply be unsuitable in SOI-based processes and recognized as such by one having ordinary skill in the art. As stated in MPEP 2143.01, “[I]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” For example, *No* provides (page 492) the following teachings with regard to trench height:

High aspect ratio trenches that are 2-5 um wide are etched into the substrate using the Bosch process...The height of the trenches will determine the height of the resonators.

In contrast to this teaching of *No* device height in SOI processing is limited to the thickness of the upper silicon layer, not the height of the trench. In other words, if the height of the trench is limited only by the depth of the etch, as taught by *No*, this is in contrast to SOI processing where the height of the device is limited by the thickness of the upper silicon layer.

Additionally, applying the steps of “forming release openings and removing the polysilicon and at least a portion of the semiconductor-on-silicon substrate” to *No* and then performing an undercut in *No* would likely result in etching away the electrodes and/or resonator in *No* and yielding an inoperative device. Thus, Applicants respectfully submit that

the proposed combination is improper and request that the rejection of claims 18 and 20-28 by *No* in view of *Lin et al.* be withdrawn.

In summary, it is Applicants' position that a *prima facie* for obviousness has not been made against Applicants' claims. Therefore, it is respectfully submitted that each of these claims is patentable over the proposed combination of references and that the rejection of these claims should be withdrawn.

VI. Canceled Claims

As identified above, claims 1-9 have been canceled from the application through this Response without prejudice, waiver, or disclaimer. Applicants reserve the right to present these canceled claims, or variants thereof, in continuing applications to be filed subsequently.

VII. Newly Added Claims

As identified above, claims 37-59 have been added into the application through this response. It is believed that no new matter has been added. Applicants respectfully submit that these new claims describe an invention novel and unobvious in view of the prior art of record and, therefore, respectfully request that these new claims be held allowable.

CONCLUSION

Applicants respectfully submit that Applicants' pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. Any other statements in the Office Action that are not explicitly addressed herein are not intended to be admitted. In addition, any and all findings of inherency are traversed as not having been shown to be necessarily present. Furthermore, any and all findings of well-known art and official notice, and similarly interpreted statements, should not be considered well known since the Office Action does not include specific factual findings predicated on sound technical and scientific reasoning to support such conclusions. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,



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